



inps journal

Indiana Native Plant Society

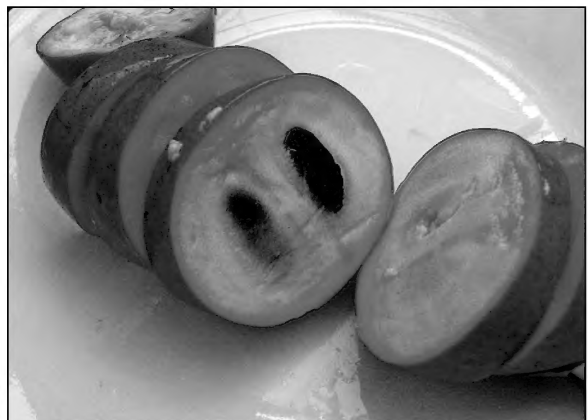
Fall 2022

Fruit Salad

By Scott Namestnik

If asked to describe a fruit, most people would immediately turn their minds to the produce aisle at the grocery store. This is

The pawpaw fruit is a berry that typically has 3 or 4 large seeds inside its fleshy pulp.



Paul Rothrock



Arrow-wood viburnum has cherry-like drupe fruits. Each fruit has a pit containing a single seed inside.

not the case for a botanist who defines a fruit as the seed bearing part of a plant consisting of a mature ovary and sometimes additional flower parts. The fruit is certainly one of the most important structures when it comes to plant reproduction and dispersal. Over time, flowering plants have evolved myriad forms of fruit that defy simple classification.

Within this diversity let's consider five common types – two that are fleshy and three that are dry.

When you think of a fleshy fruit, you may think of something

like a cherry (*Prunus* spp.). A cherry is a good example of a drupe, which is a fleshy fruit that has a single seed per carpel (a

carpel is a chamber within the ovary) and a stony endocarp (inner layer of the fruit wall) that tightly surrounds the seed. Using the example of a cherry, the ovary has a single carpel with a single seed, and when the fruit forms, the "pit" is the stony inner layer of the fruit; the seed is inside of this stony layer. Native shrubs with drupe fruits in autumn include the genus *Viburnum* (e.g., *V. acerifolium* and *V. dentatum*). The Indiana

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flora has nearly a dozen native *Viburnum* species, many worthy of inclusion in your home landscape,

You've probably heard the argument that a tomato (*Lycopersicon* spp.) is a berry fruit. Well sure it is ... it is the matured ovary and contains the seeds! No one would question that a tomato is fleshy. If you cut a tomato in half, you will see that it has several carpels, but instead of having just one seed per carpel, tomatoes have many seeds per carpel. In addition, the inner layer of the fruit wall is not stony but rather is fleshy throughout.

Perhaps just as surprising, the pawpaw (*Asimina triloba*) fruit is also a berry. In this case, though, the seeds are large and few in number. Other native species with berries in the autumn include the wild grapes (*Vitis*),

Fruit Salad — continued on page 3

Pawpaw (*Asimina triloba*)

By Michael A. Homoya

It seems everyone has heard of the proverbial “pawpaw patch,” but how many have seen

one? If you’ve done much hiking in Indiana, odds are extremely high that you have. That’s because pawpaw is the most common small tree in the understory canopy of Indiana’s forests. Pawpaw can be found on well-drained floodplains, on north-facing slopes, in flatwoods, and in deep ravines, usually growing in colonies that can be quite extensive (hence the name pawpaw patch). While the plant can grow to heights of 30 ft (10 m), its most conspicuous feature is its large leaves, each averaging about a foot (30 cm) in length. The leaves, when bruised, emit an odor that most people find unpleasant. It’s so bad that even a hungry white-tailed deer (*Odocoileus virginianus*) usually won’t eat them. The flowers are malodorous as well, with a scent somewhat similar to rotten apples. Each flower consists of two rows of three rather leathery, deep purple petals. They bloom in early spring, well before the tree’s leaves emerge.

The fruit of the pawpaw tree also goes by the name of pawpaw. It’s shaped like a big bean or stubby banana with a green outer skin that becomes brownish-yellow or black when fully ripe.

A ripe pawpaw has a creamy, custard-like consistency that smells and tastes to some like an overripe banana, hence one of its other

common names, “Indiana banana.” Pawpaw fruits are a favorite of wildlife as well as some people. Most pawpaw trees don’t produce fruits, so consider yourself fortunate if you find some. Finding ripe fruits is even more rare – opossum (*Didelphus virginianus*), raccoon (*Procyon lotor*), and other forest animals usually get them first. A testament to this is the large number of pawpaw seeds found in the scat these critters deposit on fallen logs. Other wildlife that benefit from pawpaw include the beautiful zebra swallowtail (*Protographium marcellus*), a butterfly whose caterpillars feed only on pawpaw leaves.

The big leaves of pawpaw give it an almost tropical appearance, which fits because the plant is a member of a large (more than 2,000 species), mostly tropical group known as the custard apple family. Indiana’s pawpaw species is certainly the hardiest member of the family, growing naturally as far north as southern Ontario and western New York. Seven other species of pawpaw (*Asimina*) exist, found only in the United States, mostly in Florida or portions of other southeastern states.

Pawpaw was important to early Native Americans. In addition to their use of the fruit as food, strips of pawpaw’s thin but tough bark were an important source of twine. The genus name *Asimina* appears to have been constructed from the French-Algonquian word *assimine*, the latter likely derived from *raahsimina*, the term used for pawpaw by certain indigenous peoples. Pawpaw is possibly a corruption of the Arawakan word *papaia*, or papaya (*Carica papaya* L.), an unrelated but somewhat similar-looking tropical fruit. In fact, the latter goes by the name pawpaw in some tropical locales. On your next hike in the woods check out a pawpaw patch and appreciate its many virtues. Who knows? If you’re lucky, you might even find a mawmaw patch nearby. But that’s another story.

Mike Homoya, a member of INPS Central Chapter, is the retired botanist from the Indiana Department of Natural Resources, Division of Nature Preserves. He has authored multiple books; most recently he co-authored Wildflowers of the Midwest.



Paul Rothrock

The pawpaw flowers appear over a two week period in April before the leaves expand. Note that the maroon coloration develops as the flower opens.



Paul Rothrock

The pawpaw fruit can be hard to find since they are enjoyed by various mammals. But in addition, studies show that the initial fruit-set can be low due to an insufficient supply of pollinators.

Fruit Salad — continued from cover

with seven species in Indiana.

The second broad category of fruits are termed dry fruits. These can disperse seeds either by naturally breaking open to free the seeds (dehiscent fruits) or by remaining intact with the seeds inside the fruit after the fruit has been shed by the plant (indehiscent fruits).

The most common type of dehiscent dry fruit is the capsule. A capsule forms from an ovary that has two or more carpels (remember that a carpel is a chamber within the ovary). In Indiana's autumn flora watch for capsule fruits on the beautiful rose-mallow (*Hibiscus* spp.). The small tree, bladder nut (*Staphylea trifolia*), develops a curious capsule fruit. It might be likened to a papery balloon and has up to four large seeds inside.

Other dry fruits are indehiscent – the seeds remain inside the fruit even after the fruit has been shed by the plant. The most common type is the achene. These have a single seed that is connected to the fruit wall at only one point. The ovaries of virgin's bower (*Clematis virginiana*) develop

into achenes at maturity, although with modification of the style into a feathery plume that aids in wind dispersal. Other achene fruits come with papery wings as in ash (*Fraxinus* spp.). These winged versions are dubbed samaras.

The fall flora of Indiana is dominated by members of the aster family (Asteraceae). Their fruit has an achene-like structure but develops from an inferior ovary. In this case, the fruit is often known as a cypsela, but some botanists still consider it an achene.

The type of fruit that most people probably picture when they hear "indehiscent, dry fruit" is a nut. Nuts originate from compound ovaries and have stony fruit walls or outer shells. An oak (*Quercus* spp.) acorn is a classic example of a nut; the seed is located inside of the acorn.

You can see that there is a lot of variety when you talk about fruits. Many are quite small, and examination and identification is aided by a hand lens. Others are quite large and conspicuous. Regardless, autumn and early winter is a great time to engage with these intricate inventions of nature.

Scott Namestnik is co-author of two books on Indiana and Midwest flora and is the State Botanist with Division of Nature Preserves in the Indiana Department of Natural Resources. He is a member of the North Chapter of INPS.



Paul Rothrock

Bladder nut fruits are eye-catching, balloon-like capsules.



Paul Rothrock

Rose-mallow produces a typical capsule that splits along multiple suture lines.

A web search will turn up an array of recipes and videos on how to prepare pawpaws.

Here are a few ideas:

pawpaw pudding

<https://foragerchef.com/paw-paw-pudding/>
<https://www.savorymomentsblog.com/2019/10/pawpaw-pudding.html>

pawpaw ice cream

<https://honest-food.net/paw-paw-ice-cream/>
<https://grilling24x7.com/homemade-pawpaw-ice-cream/>

pawpaw bread, jam, milkshake, pie, & more

<https://www.kysu.edu/academics/college-ac/school-of-ace/pawpaw/recipes-and-uses.php>

Book Review:

“Braiding Sweetgrass: Indigenous Wisdom, Scientific

by Robin Wall Kimmerer

“I wanted to know why we love the world, why the most ordinary scrap of meadow can rock us back on our heels in awe.”

Reviewed by Amy Perry

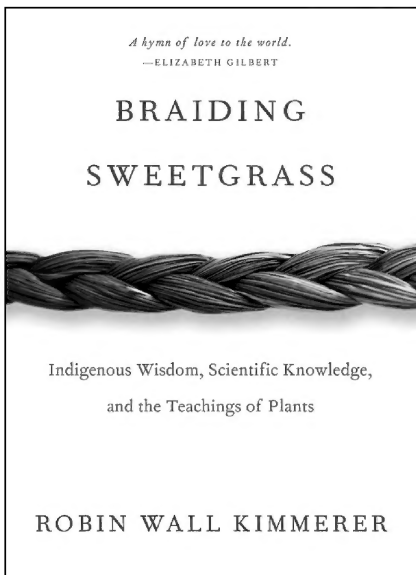
In case you missed it when it first was published in 2013, it would be worth your while to read *Braiding Sweetgrass* by Robin Wall Kimmerer (Milkweed Editions, Minneapolis, MN). The book combines passionate pleas for care of the earth with clear explanations of botanical and biological processes, both often expressed in attractive metaphors based on Native American beliefs and myths. The author is a SUNY Distinguished Teaching Professor of Environmental Biology. She also is an enrolled member of the Citizen Potawatomi Nation.

The author grew up in a Native American family in the northeastern U.S. When, as a newly arrived freshman in college, she was interviewing with a professor, he asked why she wanted to study botany. She replied, “... to find out why asters and goldenrod looked so beautiful next to each other.” Of course, the professor had no idea what to do with that reply. She points out that he should have said that her question was bigger than science could touch. This episode encapsulates the conflict the author formerly felt between the scientific or objective way of approaching the world and a more connected way, a conflict she has reconciled.

Sweetgrass is in the title of the book

because it was brought to earth by Skywoman, who created all plants, and some creation stories say that sweetgrass was the first plant to grow on earth. As for braiding, the author states that the book is “a braid of stories meant to heal our relationship with the world.” It has three strands: “indigenous

Imagine walking through a richly inhabited world of Birch people, Bear people, Rock people, beings we think of and therefore speak of as persons worthy of our respect, of inclusion in a peopled world. We Americans are reluctant to learn a foreign language of our own species, let alone another species. But imagine the possibilities. Imagine the access we would have to different perspectives, the things we might see through other eyes, the wisdom that surrounds us. We don't have to figure out everything by ourselves: there are intelligences other than our own, teachers all around us. Imagine how much less lonely the world would be.



Knowledge and the Teachings of Plants”

ways of knowing, scientific knowledge, and the story of an Anishinaabekwe scientist trying to bring them together.”

If modern civilization were in a position to adopt the values and customs described and advocated by the author, our relationship with the world could be well on its way to being healed. However, modern civilization is not. Fortunately, in the meantime we can enjoy learning about Native American ways of thinking and being. For example, Kimmerer describes customs based on gratitude and reciprocity, communal living, and restrained harvesting that benefitted both humans and the plant community. She is a skilled storyteller who enlivens many Native American myths.

Braiding Sweetgrass is replete with descriptions of salamander behavior, pecan production, and the nutritional relationship of corn, beans, and squash. These intermingle with accounts of personal experiences in the woods and of things she did when her two daughters were young, such as making maple syrup. She describes making friends with an older neighbor woman who had long personal experience with plants and the remedies they could provide. This woman supplied a wisdom very different from the academic people the author usually encounters.

If you like metaphors and myths, if you value nature and common sense and deplore unnecessary destruction, if you love to be outdoors, if you like vivid detailed descriptions, if you like to hear about making things from scratch, you will like this book. I read the book by listening to it. Imagine me driving around in the wintertime listening to the author herself talk about her passions, including her joy in the intricacy and beauty of the natural world and the things we can learn from indigenous ways of relating to it.

Amy Perry, a member of Central Chapter, has been taking walks and guided hikes all her life. She enjoys approximately 100 native plant species at her home, has served on the INPS invasive species SWAT team, and serves on the Hamilton County Master Gardener native plant committee.

*Hold out your hands
and let me lay upon
them a sheaf of freshly
picked sweetgrass,
loose and flowing, like
newly washed hair.
Golden green and
glossy above, the stems
are banded with purple
and white where they
meet the ground. Hold
the bundle up to your
nose. Find the fragrance
of honeyed vanilla over
the scent of river water
and black earth and you
understand its scientific
name: Hierochloa
odorata, meaning the
fragrant, holy grass. In
our language it is called
wiingaashk, the sweet-
smelling hair of Mother
Earth. Breathe it in and
you start to remember
things you didn't know
you had forgotten.*



Sweetgrass is native to southern Canada and the northwest, Great Plains and New England regions of the United States, including Indiana.

sl.wikipedia.org - art by Norman Criddle from "Farm Weeds" by Clark, George and Fletcher, James

INPS Annual Conference 2022 Set!

By Roger Hedge

Keynote speaker
Tony Reznicek will be
presenting "From the
Ground Up: Indiana
Landscape and Flora"



Judy Kelly

Saturday, October 22 is the long-awaited date for our first in-person INPS Annual Conference since 2019! This year it will be held at the 502 Event Center in Carmel, Indiana. Activities are also planned for Friday before the main conference; so do both days if at all possible.

The grand slate of speakers for the conference's main event on Saturday include two highly regarded keynote speakers, Dr. Anton (Tony) Reznicek and Annie Novak. Tony's presentation "From the Ground Up: Indiana Landscape and Flora" will reveal how landscapes in Indiana evolved. Tony is Emeritus Curator of the University of Michigan Herbarium. His special interest is the systematics and evolution of sedges, particularly in Latin America. He co-authored the *Field Manual of Michigan Flora*. But don't let these academic credentials fool you; Tony animates his deep knowledge of the flora of the Great Lakes region and its history in ways that are broadly appealing.

Annie Novak's presentation, titled "Reading a Landscape", will introduce a fundamental approach to observing our natural environment. She is founder and director of "Growing Chefs: Food Education from Field to

Fork"; the manager of the Edible Academy at the New York Botanical Garden; co-founder of Eagle Street Rooftop Farm in Greenpoint, Brooklyn; and author of *The Rooftop Growing*

Guide: How to Transform Your Roof into a Garden or Farm. Perhaps you have heard Annie on NPR and seen her writings in the New York Times.

Gabriela Nunez-Mir will speak about her research on the "Regional Dynamics of an Invasive Insect Pest, European gypsy moth (*Lymantria dispar*)," and will share her insight into what drives the spread of invasive insect pests and their impacts on forest ecosystems. Having earned her PhD from Purdue University, Gabriela currently is a member of the University of Illinois at Chicago's "Bridge to the Faculty" Scholars Program.

Nathanael Pilla is host of "Botany and Beer," a YouTube channel he created with the goal of making field botany interesting and easy to understand. Nathanael will illustrate how he showcases the intricacies of plants by weaving common themes with botanical jargon, through videos, presentations, and hikes. A botanist with Orbis Environmental Consulting, Nathanael recently co-authored *Wildflowers of the Indiana Dunes National Park*.

Gabrielle Cerberville will talk about "Environmental Phoenixes: Plants, Mushrooms, and the Scorched Earth." Through her TikTok channel @chaoticforager Gabrielle provides science-based foraging education. She has spoken at various mycological and botanical societies and universities and partners with several local organizations to bring free outdoor education to the public.

Barb, Mike, and Wes Homoya will share "The Homoya's Hoosier Orchid Big Year" when they embarked on an ambitious quest in 2021 to track down every extant type of orchid in Indiana. Barb, retired nurse; Mike retired botanist/plant ecologist with DNR Nature Preserves and author of "Orchids of Indiana"; and Wes who conducts avian surveys in Colorado and leads international birding trips, comprise a family team that enjoys meeting challenges.

Pre-conference activities planned on Friday include a morning tour of the Green StormWater infrastructure in Carmel, hosted by the city's StormWater Administration and

— continued at right



Naima Green

Keynote speaker
Annie Novak will
present "Reading a
Landscape."

Florathon 2022

the Hamilton County SWCD, an afternoon hike by Karen LaMere entitled "Native Use of Nature's Bounty" at the Monon Center East in Carmel, and hikes at Central Indiana Land Trust's (CILT) Oliver's Woods Nature Preserve, one hike offered in the morning and one in the afternoon.

If the conference isn't already exciting enough, do not overlook the seed swap! Further details on how to participate are available in the right-hand column of the INPS web page, Growing Native Plants from Seeds: <https://indiananativeplants.org/growing-native-plants-from-seed/>.

A block of rooms has been reserved for INPS at Hampton Inn & Suites Indianapolis Keystone, 8980 River Crossing Blvd, Indianapolis. To be assured of a room, reservations should be made by October 7. When you call (317-706-7500) mention that you are attending the conference for the special rate.

Conference updates and on-line registration can be found at <https://indiananativeplants.org/gatherings/annual-conference> or find the registration link and conference information on the INPS home page. The registration deadline for the in-person conference is October 10; there will also be a virtual version with a registration deadline of October 20.

Roger Hedge is co-chair of the 2022 INPS Annual Conference.

INPS Annual Conference

***October 22
at the 502 Event Center in
Carmel***

Register online at

<https://indiananativeplants.org/gatherings/annual-conference>

By Barbara Homoya

"Someone has said that this may be the first time in history that we can save the human race by lying in front of the TV and doing nothing." So began my Florathon article in the Fall 2020 INPS Journal, detailing the efforts of the individuals who participated during that pandemic year of social isolation. Happily, we were able to return to a team format for 2022, and what a response! There were 5 teams – 3 of them new, with 13 participants.

Between April 16th and May 31st those five teams surveyed 6 counties in search of native wildflowers in bloom. The highest species total results were: first place, *Always Be Botanizing* (Central chapter: Mike, Barb and Wes Homoya) with 87 species; second place, *Wild West* (West Central chapter: Greg Shaner, Mary Sue Waser, Patty Jones, Mickey Penrod, Susan Ulrich) with 56; and *Bloomin' Stellarias* (South Central chapter: David Mow, Steve Dunbar) placed third, finding 51 species in bloom.

Over \$2500 was donated by over 30 donors and 10 new members were added to the INPS membership roll. Thank you to those donors who gave so generously and to the individuals who solicited them.

INPS chapters were challenged to field at least one team and three chapters did so: West Central chapter had one team, South Central had 1.5 teams and Central had 2.5. How did that happen? The Goose Pond Hunters team included a member from Central chapter and a South Central member in a lovely display of cooperation. And kudos to David Mow for participating on TWO teams!

Previous Journal articles have highlighted the experiences of Florathon participants, and we hope to continue this in the future, so watch for their stories in upcoming issues. Without exception, Florathoners have expressed having a fun and challenging experience, while learning new plant species. Please consider forming a team for Florathon 2023! If you have any questions or want to find a team to join you can contact Barbara Homoya, Florathon chair. Hopefully next year there will be a team from every chapter, and we will have the best and most successful Florathon ever!

Barbara Homoya chairs the Florathon and has enjoyed participating in all five events with her Always Be Botanizing teammates.

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Mission

To promote the appreciation, preservation, scientific study, and use of plants native to Indiana.

To teach people about their beauty, diversity, and importance to our environment.

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INPS JOURNAL is published quarterly for members of the Indiana Native Plant Society.

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Submissions: Anyone may submit articles, photos and news items. Acceptance is at the discretion of the editors. Submit text and photos (300 ppi) via email to journal@indiananativeplants.org. Query for writer's guidelines. Deadlines: Jan. 1 issue – Oct 22; April 1 issue – Jan. 22; July 1 issue – April 22; Oct. 1 issue – July 22.

Membership: INPS is a not-for-profit 501(c)(3) organization open to the public. Join at www.indiananativeplants.org.

Share online: Send information for posting to webmaster@indiananativeplants.org.

Chill in the Air

By Nancy Tatum

There's a chill in the air. In a couple of weeks, winter will officially begin. Scarlet, my dog, and I took an enlivening walk this morning. The wind was coming from the east as we worked our way out of the neighborhood, away from the noise of cars and windchimes. It didn't take long to feel removed from civilization. How fortunate to live close to wild places – hedgerow, marsh, and woodland park. Wildlife need places like this. So do we.

As the two of us continued, I heard a noise that sounded a bit like running water. I stopped to see where it was coming from. The wind was blowing the still clinging leaves on the branches of a small oak tree, sounding like water. I stood there. . . listening. Waiting. A chickadee called in the distance, then a red bellied woodpecker. Next, the soft call of a bluebird followed by a chirping robin. The trees were full of life.

I was surrounded by the smell of late autumn. Crisp air. I stopped to breathe it deep into my lungs. Scarlet loves to walk through the fallen leaves as they crunch under her feet. It must be amazing and possibly overwhelming to have the sense of smell she has. She stopped often to sniff the ground as she tried to figure out who was here before us. A deer? A coyote? Probably just another dog.

All the flowers and grasses have turned rainbow brown. Berries still cling to wild grape vines (*Vitis* sp.) and pokeweed (*Phytolacca americana*). The common milkweed (*Asclepias syriaca*) seed pods have popped open. I watched as the wind grabbed some of the fluffy seeds and carried them upwards, floating ever so gracefully in the breeze, hopefully to a place where they will fall to the ground and be covered with snow. There they can take root in the soil and grow tall for the monarch butterfly caterpillars to munch on the tasty leaves in the summer.

But today it's time for winter and cold temperatures and snow. The natural world in Indiana needs that for the continued cycle of life. Embrace the season!

Nancy Tatum is Vice-President of the INPS Central Chapter.



Courtesy of Nancy Tatum

Meet Nancy and her four-legged companion, Scarlet.



Paul Rothrock

*The feathery inflorescence of native common cane (*Phragmites australis* subsp. *americanus*) contrasts against the reds and oranges of oak (*Quercus* sp.) and maple (*Acer* sp.) leaves.*

*Swamp white oak (*Quercus bicolor*) leaves, and other oaks, attain russet hues that shimmer in late autumn.*



Paul Rothrock

The Not So Sweet: Sweet Autumn Clematis

By Gillian Field

The native virgin's bower (*Clematis virginiana*) and the invasive sweet autumn clematis (*Clematis terniflora*) have similar looking flowers and fruits. Both species bloom in Indiana from August to September. Both can drape over vegetation and look like a blanket of white flowers when blooming. And after flowering, the pistils of both species undergo a remarkable transformation. Their styles elongate greatly into feathery appendages. These give the magnificent masses of achene

fruits a fluffy appearance.

So how do you tell them apart? Check the leaves! The native virgin's bower has toothed leaves with 3 leaflets, while the invasive sweet autumn clematis has smooth-edged leaves and 3 or 5 leaflets. A more subtle trait relates to flower gender. Those of virgin's bower are essentially unisexual (thus at least two vines are needed for good fruit production), while sweet autumn clematis has mostly bisexual flowers.

Native to Japan and China, sweet autumn clematis vine was introduced to the US in 1877

— continued at right

Left: The vigorous vines of sweet autumn clematis produce masses of feathery fruits. This vine has engulfed one end of a porch.



Right: Leaves of sweet autumn clematis have 3 to 5 smooth-edged leaflets.



Left: Virgin's bower has coarsely toothed leaflets. The flowers look much like those of the non-native species but are unisexual.



Right: The clusters of virgin's bower achene fruits have dramatic elongated styles.



Paul Rothrock

INPS Annual Seed Swap

as an ornamental. It is extremely aggressive and can rapidly climb woody plants and structures, reaching up to 30 ft (10 m) in length, two times longer than the native species. This pretty but invasive vine forms dense tangled areas that can cover the ground and other vegetation. The wispy swirls of fruits are readily dispersed by wind.

Compared to the native virgin's bower, sweet autumn clematis is more tolerant of a variety of soils and moisture conditions. Dense mats of sweet autumn clematis suppress seed germination and smother small plants, shrubs, and even small to medium sized trees. It invades woodland edges, fence rows, road verges, and neglected areas. It is ranked as an invasive species in Indiana, but has not been added to the Indiana Terrestrial Plant Rule at this time. Thus, it may still show up in plant nurseries.

How to control this species? Digging up roots of single vines is possible, but discouraged for large infestations because the soil disturbance may encourage it to spread further. Any stem or root material left behind will continue to grow, so hand pulling, cutting, and mowing is not an effective means of control. Chemical treatment with systemic herbicides, such as glyphosate (non-selective) or triclopyr (broadleaf specific) has been shown to be effective as a foliar spray. Areas of control will need to be monitored in the face of possible resprouting or new infestation.

So, in lieu of sweet autumn clematis, give the native virgin's bower a try. Enjoy the amazing variety of native pollinating insects it attracts. Mulch the soil to retain moisture. And be sure to have several vines to ensure a plethora of showy fruit clusters.

Resources:

Autumn Awfuls video on MC-IRIS Youtube Channel created by Ellen Jacquart: <https://www.youtube.com/watch?v=yY44ijBPh60&t=197s>
Monroe County - Identify and Reduce Invasive Species (MC-IRIS): [MC-IRIS.org](https://www.mc-iris.org)
State of Indiana Cooperative Invasives Management (SICIM): <https://www.sicim.info/news/invasiveofthemonthseptember2020#>

Gillian Field, a member of the South Central Chapter of INPS, published a version of this article in the *Bloomington Herald-Times*.

Every year at our Annual Conference, participants from all over the state collect seeds from native species and freely exchange them in an organized seed swap. Find instructions for the 2022 meeting at <https://indiananativeplants.org/growing-native-plants-from-seed/> or send your questions to seed@indiananativeplants.org. 🍂



Paul Rothrock

Harvest seed pods from common milkweed (*Asclepias syriaca*) when the pods just begin to brown and split.

"Wake Up, Woods"

Christmas is coming and what better gift than a copy of *Wake Up, Woods*, the beautiful illustrated, informative, and poetic children's book sponsored by INPS. In addition, you can find excerpted readings from the book on Youtube. For example, https://www.youtube.com/watch?v=fseeQuGmg_0. These are done by Brittany McAdams, Natural Resources Coordinator with Carmel-Clay Parks and Recreation. Others are done by Mrs. Kilby of Culper County 4-H.



From Migrating Birds to

By Lee Casebere

This is a story about birds, but be assured that there is a connection to native plants and the important role they play in the lives of long-distance migratory birds on their journeys between far-flung destinations.



Lee Casebere

The elusive Swainson's thrush depends upon fat-rich fruits, such as those of spicebush, to nourish its long migration between Alaska and South America.

I – Advances in bird tracking.

For several centuries, bird banding has been a primary method used to track the movements of birds. Banding involves putting numbered or colored bands on the legs of birds, and then hoping that they are retrieved at some later time. Despite a low level of retrieval, this method has yielded extremely valuable information on the movements of birds. For example, it revealed that many birds return each year to the same breeding territories. Unfortunately, though, it has proven more difficult to learn where their migratory travels take them.

In recent decades, satellite technology has greatly changed what is known about migrations. Satellite transmitters can track precise movements of birds in real time. There are downsides, though, one being batteries will run down within a year or two unless the birds can be recaptured to replace them. Another downside is that their weight limits which birds can carry them without adverse consequences.

A recent solution, namely geolocators or GPS loggers, largely eliminates the weight problem of satellite transmitters. Geolocators can weigh as little as a fraction of a gram and are much less expensive. Satellite transmitters can cost thousands of dollars each, whereas geolocators can cost as little as a couple hundred dollars. The downsides are that the birds must be recaptured in order to download data from the geolocators, and they too have batteries that must be replaced in order to keep them operational. However, the big prize that makes it all worthwhile is that data downloaded from geolocators tell precisely where the birds have been and the routes they took to get there.

II – Nature writer and bird migration enthusiast.

Scott Weidensaul, one of our finest contemporary nature writers, has authored many books related to birds. Clearly a curious, adventurous individual, he participates in research projects designed to answer questions about migration. He has traveled throughout the world in his quest to learn the facts and then share them in his powerful, educational, and lyrical books.

In the prologue of a recent book, Weidensaul (2021) describes one of his adventures assisting researchers in Alaska's Denali National Park mist-netting Swainson's and gray-cheeked thrushes (*Catharus ustulatus* and *C. minimus*) and fitting them with leg bands and geolocators. It involved getting to a remote area carrying equipment and supplies through brushy, rugged terrain. This would be a relatively safe operation in most places in the lower 48 states, but his tale speaks of frightening moments as when a grizzly bear (*Ursus arctos*) came extremely close to the team. Indeed, what we might think to be easy and glamorous work can prove difficult and even dangerous.

III – Natural history and observations from my yard.

Swainson's thrush is one of the most abundant neotropical migrants, yet it is unknown to most folks. It does not breed in Indiana but passes through in great numbers each spring and fall on journeys to and from northerly breeding grounds where it nests in coniferous and mixed deciduous/coniferous forests. Its breeding range is immense, extending from Alaska to the Canadian Maritime Provinces. The closest its breeding range gets to Indiana is northern lower Michigan.

As a member of the thrush family, it is related to birds much more familiar to us such as American robin (*Turdus migratorius*) and eastern bluebird (*Sialia sialis*), and to some of our most accomplished avian songsters such as wood thrush (*Hylocichla ustulata*). But if it's such a common bird, why is it unknown to so many of us? I think it's because of its somber plumage and reclusive behavior. Swainson's thrush tends to keep to the woods and thickets feeding on or near the ground, all the while remaining quiet and elusive. It's about the same size as its colorful cousin the eastern bluebird, but its attire is plain by comparison.

Bushes in Our Own Backyards

At my home in Indianapolis, Swainson's thrush is one of the migrant passerines I look forward to seeing around my backyard birdbath. Most bird species visit the birdbath with gusto, coming in quickly and getting in and out in a hurry. Some, like blue jays (*Cyanocitta cristata*), are brash and noisy, but certainly not Swainson's thrush. Its approach is quiet, slow, and with a demeanor brimmed in shyness. It approaches with a few steps, and then watches carefully. Then a few more steps, and more watching. If it senses anything amiss, it is gone in a flash, only to come back in a few minutes to repeat the process all over again. Just being cautious? It seems so, but I think its shyness permeates every aspect of its character, even its singing. Many birds sing loudly and incessantly during spring migration, but this thrush is not one of them. Just as its plumage and behavior have an understated quality, so too does the fluty softness of its song.

IV – The value of native shrubs, and some amazing geolocator reveals.

Although Swainson's thrush is mostly insectivorous during the breeding season, it feeds heavily on fruits of shrubs during fall migration. Studies have shown that fruits from native fruit-bearing shrubs contain strikingly higher fat content compared to non-native species. This is important since fats are more energy-dense than carbohydrates or proteins, thus providing more energy to a migrating bird. In my yard, fall thrushes feed heartily on the fruits of spicebush (*Lindera benzoin*), rough-leaved dogwood (*Cornus drummondii*), and flowering dogwood (*Cornus florida*). The fruits of those shrubs seem perfectly timed to be ripe during September when many migrating birds are moving through Indiana.

Deeper into Weidensaul's book, he brings some closure to the story he began in the book's prologue regarding the Denali thrushes wearing geolocators. Three Swainson's thrushes fitted with geolocators in Denali in the summer of 2018 were recaptured by researchers in 2019. One of the devices had failed, but the other two told a remarkable story. Both thrushes left Denali in August, moving southeast across Canada and passing near Lake Superior, then through the Midwest, and passing near the Great Smoky Mountains by the end of September. Continuing

their journey, they crossed the Florida panhandle and flew across the Gulf of Mexico to Central America following the isthmus to Columbia by late October. From there they traveled along the eastern flanks of the Andes and finally stopped within 20 miles of one another on the Bolivia-Argentina border. The total journey was more than 8,000 miles! Four other thrushes that the researchers recaptured followed pretty much the same route to the same general area. And here's an amazing bit of information about one of these birds: it spent about a week in a suburban area near Geist Reservoir in northeast Indianapolis. Talk about bringing a long-distance migration story home to roost!

Knowing that they nest directly north of us, I would have guessed that any Swainson's in my yard was probably from the eastern U.S. or eastern Canada. I never would have guessed that a Swainson's from Alaska would pass through central Indiana on its journey south. Why not take a shorter, more direct route to the isthmus entirely over land instead of going further east to the Appalachians and then crossing the immense waters of the Gulf of Mexico? Knowing the story told by the Denali geolocators has forever changed my thoughts and feelings about Swainson's thrush. I can't help wondering – do some of 'my' Swainson's thrushes nest in Alaska?

I hope this piece has given you food for thought regarding how the fruits of native plants in your landscaping can help long-distance bird migrants on their journeys between faraway places. And if you are not deeply touched by the 8000-mile Denali thrush story, then think about it again and again until the awe of it finally sinks in.

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Lee Casebere is a naturalist, ecologist, nature photographer, and retired assistant director of DNR's Division of Nature Preserves. He is a somewhat frequent contributor to the INPS Journal and is a member of the Central Chapter.



Lee Casebere

Book Review:

“Wildflowers of the Midwest” by Michael Homoya and Scott Namestnik

Reviewed by Roger Hedge

It's no surprise that two of the finest field botanists in Indiana and the Midwest are the experts behind *Wildflowers of the Midwest* (Homoya & Namestnik 2022), a beautiful field guide with gorgeous photographs and detailed text. The authors' credentials are well known to our readers. Mike Homoya served as botanist and ecologist for the DNR Division of Nature Preserves' Indiana Natural Heritage Program for nearly 40 years. Mike's previous books include *Wildflowers and Ferns of Indiana Forests* (2012) and *Orchids of Indiana* (1993). Mike also penned the text for the popular INPS publication, *Wake Up, Woods* (2019) and served as past president of INPS and is currently a Board member. Following Mike's retirement in 2019, co-author Scott Namestnik became the Natural Heritage Program's botanist. Co-authoring this book as well as the recently published *Wildflowers of the Indiana Dunes National Park* (2022), Scott has capably transitioned into the role of state botanist in his short tenure. Scott too is quite active in INPS—serving as INPS Journal team leader and providing frequent contributions (as does Mike!) to the publication.

Before even getting to the real heart of their book, namely the large body of species accounts (over 1000 species covered!) in the defined eight-state Midwest region, the opening narrative pulls the reader in with a beautifully written preface, followed by an “Introduction—Getting to Know the Midwest”, which addresses the area's size (“nearly the size of Alaska”), elevational changes, soils and bedrock, major rivers, and the critical role of past glaciation in this region. Also discussed are notes on climate and the role of fire in maintaining natural communities, species diversity, and endemics.

Next is a voluminous chapter (especially for a field guide) on the area's ecoregions with an in-depth narrative of the natural communities within each. Mouth-watering photographs of a sampling of the natural communities are interspersed within the text, documenting the various forest, wetland, glade, cliff, and prairie communities. Indeed this is much more than your standard field guide to wildflowers. The care and level of detail put into these introductory pages clearly illustrate the depth of knowledge of the authors, not just as field botanists, but as top-notch plant ecologists.

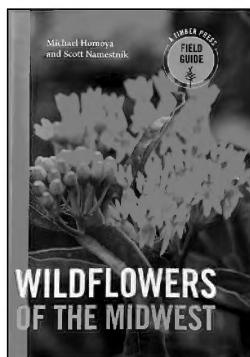
A comprehensive chapter about the 108

plant families covered in the book meticulously describes the characteristics of each and lists the genera covered later in the book. The final introductory chapter, entitled “How to Use this Book,” addresses the ‘what and why’ of species chosen for the book. In addition to native and non-native herbaceous plants (minus graminoids), some non-woody vines, subshrubs, and shrubs are included. What follows are details about the parts of a plant, especially the flower. Some of this information is also provided via line drawings inside the front and back covers of the book. Next is a thorough explanation on how the species are arranged by flower color, as well as specifics on the format of the species accounts.

The majority of the book consists of the species accounts and accompanying photographs. The accounts are arranged by flower color beginning with white. Flower color is noted in the page margin for quick reference. Species pages generally contain two species accounts per page and their respective photographs. Many species have inset photographs as well that show another part of the plant or a plant portion at a different time of the growing season, or a similarly appearing or closely related species. The standard photographs are mostly high quality and large, two photos filling roughly half the page. This is certainly a plus for the book; the larger book size with pages 8 ¾” by 5 ¾” makes this possible. This is not a pocket guide, but fits comfortably into most field bags (at least it does in mine!). Within their respective flower color, species are arranged alphabetically by family and within family alphabetically by genus name. Following the scientific name, common names are listed, then habitat and seasonal bloom period. The main body of the text includes a species description and other pertinent information including Midwestern states and ecoregions of occurrence. Lastly, photographer initials are provided with full names listed in the back of the book. A bibliography cites a number of published sources including helpful web resources.

With such a comprehensive guide as this it is easy to nitpick. There are occasional photographs that don't meet my expectations. For example, in some instances I would like to have seen diagnostic characters of a given species shown or more clearly illustrated. Having said that,

— continued at right



Potzger — continued from back cover

the authors make it clear that this is first and foremost a photographic guide centered on the flower and flower color. Moreover, it would be next to impossible to find photos showing specific morphological characteristics for all 1000 + species. Such shortcomings can be overlooked due to the quality of the species descriptions, as well as the use of occasional inset photos that do indeed depict more than just flower characteristics. My main criticisms involve the "Contents" page and the absence of a glossary. The "Contents" page includes a breakdown of the major flower colors used in this guide, with representative photographs and page numbers as to their location in the main body of the book. The page numbers given for the 'green' and 'blue to violet' flowers are incorrect. And what should be stated as 'blue to violet' flowers under a photograph of chicory erroneously reads 'brown to maroon' flowers. Fortunately, readers can find their way by simply viewing the top page edges (appropriately colored) even when the book is closed! Ideally, this work, replete with important botanical terminology, would have benefited by having a glossary. This limitation is somewhat compensated for by inclusion of such information in the thorough introductory chapters and also by use of line drawings inside the book's covers.

Aside from these items, the meticulous attention to detail in the introductory chapters as well as the species accounts deserve high praise. And one can only imagine the daunting and unenviable task of having to narrow down what species to cover in this work. Hats off to Mike and Scott for a superb job!

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were described as "immigrants." Today we would call them non-natives, maybe even invasives. They were: *Lycopus asper* (rough bugleweed), *Centaureum pulchellum* (lesser or slender centaury), *Muhlenbergia asperifolia* (scratchgrass), and *Symphyotrichum ciliatum* (rayless aster).

John was a member of the Ecological Society of America where he was elected to the prestigious position of President in 1953. He belonged to the American Institute of Biological Sciences and the Indiana Academy of Science. Even more significant, though, he was awarded the J.I. Holcomb Award in 1949 for his contribution to Butler University field of education.

In 1947, he married Margaret Esther Whitney. Esther, as she was known, made a good partner for a busy professor at their North Park Avenue home in Indianapolis. She was a teacher by profession and together they produced a book on familiar insects.

Dr. John Potzger died suddenly at age 69 of a heart attack in September 1955. During his all too short career he became an authority on changes of climate and flora of North America since the retreat of the last ice cap and served ably in administrative positions at Butler University and professional organizations. Perhaps most important of all, he was a thorough and excellent teacher whose warm personality attracted many students. One must wonder what else he would have brought to his students and study of nature had he been granted a longer life.

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Terri Gorney Lehman is a member of INPS Northeast Chapter.



photo courtesy of Marcia Moore

John E. Potzger – in the pollen analysis laboratory. The vials contain cores extracted from bogs. By isolating pollen grains from these cores, Potzger was able to determine what kinds of trees were common and document how forest composition changed over time.



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John E. Potzger: American Conservationist

By Terri Gorney Lehman

"If ever there was a story to inspire a new generation of students to do great things, it is the story of John E. Potzger." (W.D. Billings, 1956)

John Potzger is not a name known to most Hoosiers but his contributions to the field of botany are significant. He joined the faculty of notable professors of the Botany Department at Butler University in 1932 and eventually became chair of the department. This is an amazing feat considering he did not formally study botany until age 40.

John was born in Presque Isle County, Michigan, on July 31, 1886 where his father, Rev. Bruno Potzger was serving as a Lutheran minister. John was the first generation in his family to be born in the United States. Both of his parents were natives of Germany. He grew up in the North Woods and loved the forest and the unrestricted life of the wilderness. It is not surprising that in his later years he would become a forest ecologist.

As a young adult, John studied at the Lutheran Teachers College and went on to teach music for 24 years at the Emmaus Lutheran School in Indianapolis. He lived simply in rented places in the city. He studied under some of the finest piano teachers to enhance his training in music. He also began night classes at Butler University with hopes of receiving a degree in languages. A required botany class under Dr. Ray C. Friesner would change his professional career.

It was at this point he changed educational plans, earning a bachelor's and master's degree in Botany at Butler University and, in 1932, a Ph.D.

The Butler University Botany Department "powerhouse" during the 1930's. From left to right: John Potzger, Willard Clute, Mervin Palmer, and Ray Friesner. See the Fall 2021 issue of INPS Journal to learn more about Willard Clute.

at Indiana University. Immediately he began teaching at Butler University where he would remain until his death 23 years later. In 1952, after the death of Ray Friesner, Potzger rose to head of the Botany Department. In addition to his teaching and administrative duties, Potzger served as editor of *Butler University Botanical Studies*, a journal produced during the years 1929 to 1954.

He spent summers in the field, mainly in bogs in Indiana. But his research took him as far south as Texas and, in the summers of 1952-1955, he was at Mont Tremblant biological station in Quebec conducting studies in forest history.

Potzger was a pioneer in the study of pollen preserved in sediments in lakes and bogs. He furthered the techniques used to sample pollen via peat cores and, with his graduate students, he did extensive pollen analysis of bogs to determine the history of vegetational changes in Indiana. His work demonstrated that forests in the state once consisted of spruce and fir rather than the hardwood species we see today. His pollen studies of Bacon's Swamp in Marion County and an extinct lake in Hendricks County were seminal in this research. However, his pollen samples from Texas confirmed the broad geographical extent of the climatic shift that occurred during the last ice age.

In 1946, John along with Ray Friesner, Charles Deam, and a few Butler students, went on a field trip to Wolf Lake in Lake County, Indiana. On this trip, despite the recent publication by Deam of his 1940 *Flora of Indiana*, four plant species new to the state were discovered. They

Potzger — continued on page 15

